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ABSTRACT

One consequence of the information explosion is found in the area of media research methodology. The accessibility of the computer has not only broadened the scope of electronic media research but has also helped media scholars to develop new, more accurate, and more reliable media research methodologies. Whereas in the past, electronic media researchers depended greatly on borrowed media research methodologies developed mostly by psychologists and social scientists, today the field of communication studies has developed its own media research methodologies. In an attempt to provide an overall view of the present state of affairs in media research methods, this paper outlines, discusses, and exemplifies innovative electronic research methodologies. The first section briefly examines the three conventional approaches to electronic media research--the historical, descriptive, and experimental. In addition, it surveys the existing methods of electronic media research along with the established techniques or tools of data gathering. The second section deals with those new media research methodologies, instruments, and techniques adopted by media researchers since the information explosion caused by computer technology. The last section of the paper provides an overall view of the media research methodologies used by those in the field of communication studies and projects some future trends in electronic media research methodologies. (Forty-six references are attached.) (Author)

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Media Research Methods in Information Society

by

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Abstract

Another consequence of the information explosion is found in the area of media research methodology. The accessibility of the computer has not only broadened the scope of electronic media research but has also helped media scholars to develop new, more accurate, and more reliable media research methodologies. Whereas in the past, electronic media researchers depended greatly on borrowed media research methodologies developed mostly by psychologists and social scientists, today the field of Communication Studies has developed its own media research methodologies. In this paper such innovative electronic research methodologies are outlined, discussed, and exemplified in an attempt to provide an overall view of the present state of affairs in media research methods. The first section of the paper briefly examines the conventional three approaches to electronic media research--the historical, the descriptive, and the experimental. In addition, it surveys the existing methods of electronic media research along with the established techniques or tools of data gathering. The second section of the paper deals with those new media research methodologies, instruments, and techniques adopted by media researchers since the information explosion caused by the computer technology. The last section of this paper provides an overall view of the media research methodologies used by our colleagues in the field of Communication Studies and projects some future trends in electronic media research methodologies.

Media Research Methods in Information Society

It was inevitable that the information explosion brought on by the computer technology would have a direct impact on the study of the media, particularly the electronic communication media. Looking at the research works of the scholars of electronic media one can easily observe drastic changes in at least three areas. First, there are noticeable changes in the selection of research topics. The traditional trends in media "content" related research has given way, and is being gradually replaced, by media "process" related research. A few years ago empirical research in television composition, for example, was critically scarce (Metallinos, 1985, p. 298). Today such research is found in the journals of our field more readily. Second, there are observable changes in research "with" as opposed to research "on" media. The difference of these two types of research is explained by Salomon and Clark (1977, p. 102) as follows: "Whereas research with media only employs them as modes of stimulus presentations, but studies nothing inherently connected with them, research on media treats them as its major focus of investigation." More and more researchers are utilizing the media to study the media. Third, there are considerable improvements and expansions in media research methodologies, media research instruments, and techniques of data gathering. For example, whereas in the past the main media research methodologies utilized were case studies, case histories, surveys, interviews, critical analyses, content analyses, etc., today our media scholars employ, for the most part, experimental methodologies; they utilize new scientific instruments and apply more vigorous research techniques of data gathering

easily accessible by the computers.

It is beyond the scope of this paper to examine the changes in research topics selected or the use of media to study the media. Instead the discussion centers on the third noticeable change, namely the expansions and improvements in media research methodologies. The question, therefore, raised in this paper is: "What kinds of expansions and improvements in media research methods can we point out today which were brought forth by the advancements in science and technology?"

In order to answer this question it is necessary to first examine the various traditional approaches to media research, to outline the present media methodologies in existence, and lastly we need to survey the commonly used media research methodologies by our colleagues in the field of Media Communication. Consequently, the first part of this paper examines the three conventional approaches to electronic media research--the historical, the descriptive, and the experimental and it outlines the existing methods of electronic media research along with their established techniques and data gathering instruments. The second part of the paper discusses the new media research methodologies, instruments, and techniques adopted by media researchers since the information explosion brought forth by the computer technology. The last part of this paper provides an overall view of the media research methodologies commonly used by our colleagues in the field of Communication Studies and projects some future trends in electronic media research.

Traditional Media Research Methods

The literature of mass media research identifies three major approaches to media research--the historical, the descriptive, and the experimental (Dow, 1961). Under these three umbrellas of research approaches, the various genuine media research methods are to be found.

Historical Approach to Media Research

It is defined as the process of inquiry or investigation in which the researcher relies on original materials and sources of a historical nature. Such sources are historical documents, letters, reports, recordings, autobiographies, library surveys, case studies and case histories, interviews, diaries, etc. A key element to the historical approach to research is that the researcher must establish the means of documentation called predictors.

Commonly, yet not exclusively, under the major umbrella of the historical approach the media research methods found are (1) case histories, (2) case studies, (3) survey methods, (4) autobiographical and demographical methods of media research.

Case Study Method of Media Research. It is defined as the media research method for explaining and analyzing the life of a social group, a unit, a person, a family, an institution, a cultural group, etc. in one time period. For example, the influence of a community's radio program on the cultural life of that community (Murray, 1961, pp. 257-275).

Case History Method of Media Research. It is defined as the media research method for exploring and analyzing the origin and the development of an individual group or institution in a time sequence. For example, what

was the influence of Laugh-In in the development of prime time situation comedy in American television (Murray, 1961, pp. 257-275).

Survey Research Methods. Known also as the narrative research method it is defined as the research method of collecting and interpreting facts or opinions (Mulgrave & Baker, 1961, pp. 235-256). There are several survey methods used by researchers in the media such as the Questionnaire Survey, the Interview Survey, the Library Survey, the Job Analysis Survey, the Bibliographical Survey, Public Opinion Polls, etc. Survey Research, according to Babbie (1973, p. 45) is not only the most well known and widely used research method, but it is also one of the most respected, among scientists, methods of investigation.

Autobiographical and Demographical Methods of Media Research. They are defined as the research methods of collecting and interpreting facts or opinions about certain individuals or a group of individuals on a cultural setting. For example, the life (autobiographical) and the works of Charlie Chaplin, or the television viewing habits of the Inuit Indians in the Canadian North (demographical).

The Descriptive Approach to Media Research

The descriptive approach to media research is defined as the process of inquiry in which the investigator/researcher describes, analyzes, interprets, and evaluates certain media related phenomena. It is for this reason that the descriptive approach is also called analytical or evaluative. The key element of the descriptive approach is the establishment of the criteria, the value judgments, or the measurements of the study.

The descriptive approach to media research has generated four particular methods, (1) the critical method of media research, (2) the content analysis research, (3) the longitudinal research method, and (4) the vocational research methods.

The Critical Method of Media Research. It is defined as the process of inquiry in which the researcher locates the unique characteristic of a phenomenon, analyzes its internal structure, and creates the criteria for evaluating it (Campbell, 1972, p. 13). For example, what are the parallel structures of the situation comedy Family Ties and The Bill Cosby Show?

The Content Analysis Method of Media Research. According to Krippendorff (1980, p. 21): "Content analysis is a research technique for making replicable and valid inferences from data to their context." Whereas Berelson (1952, p. 18) defines content analysis as "a research technique for the objective, systematic, and quantitative description of manifest content of communication. What characterizes this method of research the most is its contextual analysis of a phenomenon or an issue. For example, the dichotomus New York Time editorials on the Israel conflicts.

The Longitudinal Research Methods. They are defined by Wimmer and Dominick (1987, p. 194) as the research methods that "involve the collection of data at different points in time." The main characteristic of these types of research methodologies is that they extend the investigation to long periods of time. Among the longitudinal media research methods continuously used are the trend studies, the cohort analysis, and the panel study (Wimmer & Dominick, 1987, pp. 195-203).

The Vocational Research Methods. In this category such professions as medicine and law have established their own ways of looking at issues related to them, due to their long tradition. As Gillmor and Everett (1981, p. 220) point out in regard to legal research:

> To the student of learning the traditions and tools of communication research, legal research in mass communication may seem at first to present a conceptual puzzle. Law, like history, is an area of substantive knowledge, but legal scholarship is also linked to specific legal research methodologies."

Legal and medical research employ specific strategies in obtaining data, and depending on the nature of the research could be either content or procedure oriented, both of which receive isolated analysis and evaluation of the legal or medical issues under investigation.

The Experimental Approach to Media Research

This approach is also known as scientific, empirical, or quantitative because it utilizes control groups to make observations and to monitor them, and it almost always uses statistics or other scientific instruments to interpret data. Experimental approaches to media research, regardless of the particular method, employ research plans which are set to find predictable relationships among variables by means of controlled observations of controlled phenomena (Dickens & Travis, 1961, p. 201). The key element to the experimental approach to media research is the research design. What the predictors are for the historical approach to media research, and the criteria for the descriptive studies, the experimental designs are for the

experimental studies. All experimental methodologies fall under two major categories of experimental research--the laboratory research and the non-laboratory, or field research (Kerlinger, 1984). On the basis of the particular designs employed, the methods are divided into experimental and quasi-experimental research methods of media research (Campbell & Stanley, 1963).

Laboratory Experimental Method. It is defined as the method of media research that is undertaken to find predictable relationships among variables by means of controlled observations, of controlled (under the laboratories) phenomena. Depending upon the particular experimental design used, experimental methods can be employed in "One Shot Case Study," "Pretest-Post Test Studies," "Solomon Four-Group Design," "Post Test Only Control-Group Design," etc. (Rubin, Rubin, & Piele, 1986, pp. 6567).

Non Laboratory or Field Experimental Method. It is the same as the laboratory method, except that the laboratory controlled environment is replaced with the real, the natural setting where the phenomenon is observed and studied. In other words, the setting is the only distinction between the laboratory and the field studies (Wimmer & Dominick, 1987, p. 138). Since the natural setting usually imposes difficulties in the control of the study, the field, or non-laboratory experimental research method has certain disadvantages over the laboratory experimental research methods.

Quasi-Experimental Method. It is the method of research which undertakes the task to find predictable relationships among variables by means of not so tightly controlled observations of controlled phenomena (Campbell &

Stanley, 1963, p. 34). In this type of experimental research, the experimenter does not have tight control over the scheduling of experimental studies or over the randomization of the sampling population. The method and the study is still valid, but the control is not total.

These were the traditional media research methods found in the fields' literature.

Presently Employed Media Research Methodologies

Influenced heavily by research in electronic media, advertising, and public relations, media researchers are forced to improve the old methods and expand to new directions. A brief review of media research studies found in such journals of our field as Journal of Communication, Journal of Broadcasting and Electronic Media, Communication Research, Human Communication Research, confirms that old methodologies in media research have improved, particularly in regards to methodological strategies, selection and usage of statistics, selection construction and usage of stimulus materials, and measuring devices. Beyond any doubt the availability and the usage of microcomputers in media research was one of the key factors towards such improvements. In fact, Wimmer and Dominick (1984, p. 409) go as far as to state that: "The mass media research field has been literally re-shaped in the last 5 years." All research in the print and electronic media industries is computer assisted. Print media research on readership, circulation, typography and readability, and electronic media research on ratings, programming testing, etc., are all computer based. The computer technology has modified and expanded these two industries.

Advancements in technology, particularly computer technology, has equally caused noticeable improvements in the research methodologies utilized by the scholars of the media, the academicians in the field of communications. The brief review of research studies included in the academic journals cited above revealed that even the descriptive, the analytical, and the content analysis research methods, which traditionally were considered qualitative (non statistical) methods, today incorporate some type or another of statistical data in support of their arguments. For example, the Winter 1987 issue of the Journal of Communication (Vol. 37, No. 4) contains eight major articles, all of which are of a descriptive or critical nature and half of which include some type of computer usage in statistical data manipulation. The Winter 1988 issue of the Journal of Broadcasting and Electronic Media (Vol. 10, No. 1), consists of six major articles, four of which use statistical data which requires computer usage. What we see, therefore, is the computer availability to influence the media research methodological strategies.

The selection and use of advanced statistical analysis, mostly in generic media experimental studies, is yet another area of media research in which computer technology has had a great impact. Experimental media studies methods which used multidimensional designs with a variety of factors under investigation and which were difficult, if not impossible to measure, now are common practice among media researchers. Again, a fast glance at the experimental designs and the statistics used in various studies reported in the latest issues of the Journal of Communication Research confirms that

such advanced statistics as covariance regressions (both linear and curvilinear), correlation coefficient, coefficient of coordinance, to mention only a few, are presently commonly used.

Another area where media technology has influenced media research is in the selection, the construction, and the utilization of stimulus materials used in laboratory experimental studies. Computerized television editing and computer graphics offer both flexibility in visual selection and precision in image construction. Precision in the construction of stimulus materials for media research has been a serious drawback. Now, such uncontrolled variables can, potentially, be either eliminated or anticipated due to the computer technology.

Perhaps the greatest impact modern technology has had on the media research methods is in the area of media measuring devices and research techniques. In the business world of the print and electronic media, such new devices for measuring audience participation and size, known as rating research, as diaries, audiometers, telephone surveys, people-meters, etc. (Wimmer & Dominick, 1987, pp. 307-326), are common practice today. In order to provide the decision makers of the industry with information which will help them to predict audience participation, the industry has also invented the so-called non-rating research. According to Wimmer and Dominick (1982, p. 29): "Non-rating research provides information about what the audience likes and dislikes, analyses of different types of programming, demographic and lifestyle information about the audience and much more." Such research includes devices for program testing, music testing, news and other

programming devices, the performer Q, and the focus groups devices are widely spread and used in the industries of print and electronic media that utilize the computer.

Evidence of innovation and expansion in media related research is to be found with the increased application of two additional research measuring techniques that evaluate television programs while they are on the air--the time series analysis and the formative evaluation. The time series analysis is a research measuring technique which evaluates the various elements of a television program (such as camera angles, narrative part, lighting factors, performer characteristics, etc.) minute by minute, thus detecting the program's weak and strong points (Grand, 1988). The major advantages of this research measuring technique are first that the weak and strong points of the program can be pointed out at any given time in the process of viewing it, and second, the time series analysis provides a better control, comparison, and forecast of similar programs viewed at different times (Box & Jenkins, 1970). Numerous researchers in the field of communication are using this measuring technique.

The formative evaluation of media related research is a technique developed by the researchers of the Children's Television Workshop in New York, and which, according to Baggaley: "aims to monitor and to recommend modifications to the impact of production during its formative process" (1986, p. 7). Contrary to the usual end of the program, or summative evaluation techniques, the formative evaluation monitors the viewer's likes and dislikes of a television program, moment by moment, and those reactions are registered

instantly by the Program Evaluation Analysis Computer. This media research technique, in addition to providing instant feedback also gives a precise feedback (Baggaley, 1986, p. 7). Complex and multilevel television production variables are easily monitored and measured with this microcomputer-aided media research technique.

The academic researchers of the media, strongly influenced by the advancements of the industries research, have not only improved the older research instruments, but have brought to light new ones. The traditional measuring devices such as rating scales, questionnaires, Q Summations, Likert scales, sociometric measurements, Delphi measurements, semantic differential, etc. (Kerlinger, 1964, pp. 467-603) can still be found in research studies published in our journals. But they are usually accompanied by some additional measuring device which strengthens the outcome of the research. The information explosion, however, and the invention of the microcomputer brought to light new media measuring devices specialized according to the media under investigation, and the particular factors to be studied. Such measuring devices, for example, which are applicable to the visual communication media of photography, film, and television are the so-called neurophysiological (Metallinos, 1979), psychophysiological (Behnke, 1970), or psychobernetic (Malik, 1980). These research instruments and measuring techniques concern themselves with the covert or hidden responses to communication stimuli such as detection of eye movements and dilation of the pupils, increase in brain wave activity, changes in pulse, pressure, frequency, etc. These covert responses are accompanied by measurable sensoric

reactions or release of energy which are considered indications in level of activation, or state of arousal of the individual (Behnke, 1970). The ultimate purpose of communication media research that utilizes psychophysiological instruments is "to correlate physiological activation levels with various types of behavioral measures" (Behnke, 1970, p. 431).

All neurophysiological, psychophysiological, and psychobernetic measuring devices fall under three major categories--the sensoric reactors, the instruments that measure energy changes, and the instruments that measure volume changes in various parts of the body. They are all computer assisted in gathering and quantifying data.

Sensoric Reactors

All psychophysiological devices that measure visual and auditory perception stimuli belong in the category of sensoric reactors. Developed mostly in the field of perceptual (visual and auditory) psychology, the most commonly used instruments in communication media studies are the following:

The Depth, Size, Motion Apparatus. These are devices which measure various depth effects of phenomena, sizes of visual stimuli (Lafayette, 1980), and numerous illusions of stationary objects (Murch, 1973), or objects in motion.

Auditory Processors, Audiometers. These auditory perception measuring devices provide an accurate graphic display of informational input in upper and lower thresholds of frequency and intensity (Lafayette, 1980).

The Tachistoscopes. These visual and eidetic devices measure high-speed visual projections of words, forms, and pictures which can also be see in

parts such as left visual field or left eye and right visual field or right eye (Kimura, 1973).

Eye Movement, Eye Dilation, Recording, and Monitoring Devices. These are of two types: devices and methods that monitor the various saccadic and other eye movements (Young & Sheena, 1975), and those devices and methods that measure the dilation of the eye's pupil. The most common eye movement measuring instruments are the Differential Reflection Reading Measuring Device and the Eye-Track. The more up-to-date devices used for monitoring pupil dilation are the Monocular and Binocular TV Pupilometer Systems (Koff, Elman, & Wong, 1971; Gulf & Western, 1978), the Electrooculography (Oster & Stern, 1980, pp. 275-309), and the Optoelectronic Devices (Haines, 1980, pp. 309-327).

Instruments Measuring Energy Changes

Phychophysiological instruments measuring energy changes of the body (due to information stimulation) have been developed mainly by neurologists, neuro-physiologists, biologists, etc., and are directed in four major areas, each of which have generated several devices.

Physiological Instruments that Detect and Record Electrical Activity of the Brain. The most frequently used instruments are the EEG (Electro-encephalograph) and the BWA (Brain Wave Analyzer). While the EEG detects and measures the various patterns and amount of brain wave activity of a subject during varied states of stimulation, the BWA detects and identifies the neural efficiency of the subject in terms of learning capacity and learning disability (Ertl, 1976).

Physiological Instruments that Detect and Record Skin Resistance or Response. The GSR (Galvanic Skin Resistance) and the GSP (Galvanic Skin Potential) are the most often used devices in this area. Both are indices of activation level changes in the subject's exosomatic (external) resistance of the skin (GSR), or endosomatic (internal) resistance of the skin (GSP). Among the communication media-related variables detected and recorded by GSR and GSP psychophysiological instruments are: alertness, efficiency, difficulty, information gain, group interaction, emotional impact of words or sounds, etc. (Behnke, 1970; Johnson, 1980).

Physiological Instruments that Detect and Record Heart Beat Rate. These are instruments that provide records of activation level in the human circulatory system. The most commonly used heartbeat rate devices are the EKG (Electrocardiograph) which records the electrical activity of the heart muscle, the Sphygmograph which records the arterial pulse contraction--systolic and diastolic (Behnke, 1970), and the Stythograph which detects and measures heart rate, and consists of an ultra-sensitive microphone, an electric amplifier, and a counter (Lafayette, 1970; Behnke, 1970). Studies which detect heartbeat rates and record subjects' reactions to specific communication media stimuli always correlate the findings of these devices with other such psychophysiological instruments (Siddle & Turpin, 1980).

Physiological Instruments that Detect and Record Changes in Muscle Tension. Although there are numerous advanced models in existence today, the most frequently used apparatus that detects and measures electrical

energy generated by a subject's muscle contraction is the EMG (Electromyograph). Whether surface of intramuscular electrodes are used in the communication research test, the high and low amplitude muscle contraction is recorded in relation to the stressful or calm periods of the subject. In media-related studies, the findings of muscle tension indicators should be correlated with other such psychophysiological indicators for maximum validity and reliability (Behnke, 1970; Lafayette, 1980).

Volume-Change Instruments

Physiological instruments that detect and record changes in volume in various parts of the body are also indices of the level of activation in the circulation system, and specifically, the automatic nervous system. The devices that detect and record changes in volume in various parts of the body are collectively called (PG) Plethysmographs, from the Greek word "plethos" meaning a great number or enlargements. The commonly used plethysmographs according to Brown, Giddon, and Dean (1965) are: the Electrical Impedance Plethysmograph (EIPG), the Rheoplethysmograph (RPG), the Girth Plethysmograph (GPG), and the Photo Plethysmograph (PPG). Several communication media-oriented variables which have been detected and studied by such plethysmographic instruments are recorded by Behnke (1970).

A number of serious restrictions are imposed on researchers using biometric instruments to measure media-related variables. The signal-to-noise ratio imposed by the instruments themselves is one such restriction. The need to correlate the findings (or graphic output) of one device with the recordings of one or more other devices on the same variable is another

restriction. A third restriction is the tendency of the recorder to over-generalize on the basis of intricate readings of complex body mechanisms. Fourth, there is the need to perfectly match the initial levels of each subject's biological and physiological activities with those performed during the experimentation period. Finally, there is the need to understand the sensoric, thermal, chemical, and electrical changes of the human body as they relate to both the instrument that records such changes and the conditions under which such recordings occur. However, as Behnke (1970, p. 447) suggests: "We should not overlook the application of biometric instruments in communication media research simply because they impose serious problems and difficulties." And his suggestion is being considered by communication media researchers who utilize such advanced research instruments and measuring devices in their experimental research methodologies (Fletcher, 1985, 1982; Malik, 1980; Metallinos, 1987a, 1987b). Although the number of research studies in the field of visual communication media which employ psychophysiological measuring devices in their designs are presently limited, the prospect of greater participation is warranted. This is mostly because the computer technology is providing flexibility (in the usage) and precision (in the outcome) in communication media research measuring techniques.

Review and Future Trends in Media Research Methods

As the industries of print and electronic media have improved and expanded their research methodologies so has the academic research. In both cases the key factor was the advent of the computer technology which revolutionized and re-shaped media research.

It was pointed out that considerable improvements in media research have occurred in such areas as methodological strategies, selection and usage of statistics, selection construction and usage of stimulus materials, and construction and utilization of measuring devices. There are additional improvements made in the construction of questionnaires, the sampling procedures, etc. which were not discussed earlier due to their inherent connection with the discussion on methodological strategies.

The most noticeable expansion has occurred in the area of media research measuring devices, in general, and particularly in the area of visual communication media. The time-series analysis and the formative evaluation techniques, along with the three major categories of psychophysiological instruments, the sensoric reactors, the instruments measuring energy, and the volume change instruments, all of which are computer-assisted, have helped to re-shape the area of communication media research. Their scientific approach, the flexibility they offer, and their speed and measuring precision will invite, it is hoped, the academic media researchers to utilize them more often. When difficult to be used alone, such measuring devices can be used in conjunction with other behavioral measures. Such cases have been tried in communication research and have proven to be successful (Fletcher, 1982, 1979, 1978; Malik, 1980; Goodman, 1986; Chartrand & Metallinos, 1986; Clevenger, 1984).

All future trends in media research methods are bound to be affected by the information society and the technological changes of such a society. The Media Laboratory in MIT came closer to predicting the future trends in

media research and developments when they contended that the broadcast and motion picture industry, the print and publishing industries, and the computer industry, in the year 2000 AD, instead of being three separate entities will be all together. As Stuart Brand (1987, p. 11) explains:

> Negropoute's [the head of the MIT's Media Lab] vision: all communication technologies are suffering a joint metamorphosis, which can only be understood properly if treated as a single subject, and only advanced properly if treated as a single craft. The way to figure out what needs to be done is through exploring the human sensory and cognitive system and the ways that humans most naturally interact. Join this and you grasp the future.

It seems as though the old and the new media research methodologies will be still used to investigate such media effects areas as "uses and gratifications," "agenda setting by media," "antisocial and pro-social effects of media content," "cultivations and perceptions of social reality," and "advertising and the socialization of children" as described by Wimmer and Dominick (1987, pp. 371-405). However, more emphasis will be placed on the process, rather than the content of media programming. More attention will be given to the experience of the technology, rather than the mere observation of the phenomena posed by the information society. There will be more integration of industries, disciplines, and areas of inquiry. Although modern technology is in constant flux and grows very rapidly, more scientifically sound theories of the communication media will be generated as a consequence of better research methodologies employed (Steinfield & Falk, pp. 479-490).

Technological changes within the media of communication such as cable television, satellite broadcasting, HDTV, computerized (digital) television, 3-D imagery in the broadcast industry, large screens in television viewing, and a host of others will undoubtedly generate new media related research needs (Metallinos, 1988). And such media research needs will generate new strategies for research, in short new media research methods.

The future in media research methodologies looks both promising and exciting. It is one area in human endeavor that technology is not a detriment but an asset to development and progress.

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